What is claimed is:

1. A multi-tone signal communications method for communicating information using N tones, where N is a positive integer greater than one, the method comprising:

generating N analog signals, each one of the N analog signals corresponding to a different one of the N tones; and

transmitting the N analog signals into a communications channel using M antennas, where M is an integer and where $1<M\leq N$.

2. The method of claim 1, wherein M=N.

3. The method of claim 1, further comprising the step of:

separately amplifying each of the N analog signals prior to transmitting said N analog signals.

4. The method of claim 3, wherein each of said N analog signals has a duration corresponding to at least a symbol transmission period and wherein each of the N analog signals includes a periodic signal representing a symbol to be transmitted during said symbol transmission period, the method further comprising:

separately generating N signal prefixes, one signal prefix being generated for each one of the N analog signals from the one of the N periodic signals included in the corresponding one of the N analog signals.

5. The method of claim 4, wherein the N periodic signals and signal prefixes are generated in the passband.

6. The method of claim 4,

wherein each of the N analog signals has a duration corresponding to multiple symbol transmission periods and wherein said included periodic signal represents a current symbol and wherein each of the N analog signals further includes a periodic signal representing a preceding symbol; and

wherein each one of the N signal prefixes is generated from the corresponding one of the N analog signals as a function of the periodic signal representing the current symbol and the periodic signal representing the preceding symbol.

7. The method of claim 4, wherein each of the N signal prefixes includes multiple parts and wherein the step of separately generating N signal prefixes includes, for each one of the N analog signals:

generating a first cyclic prefix part from the included periodic signal representing the current symbol; and

generating a second prefix part from the included periodic signal representing the preceding symbol and from the first cyclic prefix part.

8. The method of claim 7, wherein the step of generating a second prefix part includes cyclically

extending the periodic signal representing the included preceding symbol and cyclically extending the first cyclic prefix part to correspond to the same time period; and

combining and attenuating the cyclically extended portion of the first cyclic prefix part and the cyclically extended portion to the included periodic signal representing the preceding symbol.

9. The method of claim 4, wherein each of the N signal prefixes includes multiple parts and wherein the step of separately generating N signal prefixes includes, for each one of the N analog signals:

generating a first cyclic prefix part from the included periodic signal representing the current symbol; and

generating a second prefix part to be a periodic signal, the beginning of the generated second prefix part having the same phase as the periodic signal representing the preceding symbol and the end of the generated second prefix part having the same phase as the first cyclic prefix part.

10. The method of claim 6, wherein each of the N periodic signals is a sinusoidal wave.

11. The method of claim 6, wherein each of the N periodic signals is a square wave.

12. A multi-tone signal communications method for communicating information using N tones, where N is a positive integer greater than one, the method comprising:

generating in parallel, for each one of the N tones, a separate periodic signal including at least one high order harmonic signal component that is different from the fundamental frequency signal component of said tone; and

transmitting the generated N periodic signals into a communications channel.

13. The method of claim 12, wherein the periodic signal generated for each of the N tones, includes multiple high order harmonic signal components.

14. The method of claim 12, wherein the generated periodic signal includes a square wave.

15. The method of claim 12, further comprising:

generating, in parallel, for each one of the N tones, a separate periodic signal prefix.

16. The method of claim 15, wherein the step of generating a separate periodic signal prefix for each one of the N tones includes, for each one of the N generated prefixes:

generating a cyclic prefix portion; and

generating a continuity signal portion, the continuity signal portion being generated as a function

of a previously generated periodic signal and the current generated periodic signal.

17. The method of claim 15, further comprising, for each one of the N tones, combining in the passband, the periodic signal corresponding to the one of the N tones with the corresponding one of the N periodic signal prefixes.

18. A multi-tone signal communications method for communicating information using at least N tones, where N is a positive integer greater than one, the method comprising:

separately generating, for each one of the N tones, a passband periodic signal representing a symbol; and

transmitting the N generated passband periodic signals.

19. The method of claim 18, wherein the passband periodic signals for each one of the N tones are generated in parallel; and

wherein the step of transmitting the N generated passband periodic signals includes broadcasting different ones of said N passband periodic signals using different antennas.

20. The method of claim 18, comprising:

combining at least some of the N generated passband periodic signals prior to transmission.

21. The method of claim 18, wherein at least some of the N generated passband periodic signals include a high order harmonic signal component in addition to a fundamental frequency signal component, the high order harmonic signal component having a frequency which is higher than the frequency of the fundamental signal component.

22. The method of claim 21, wherein each of the N generated periodic signals is a square wave.

23. The method of claim 18, further comprising:

generating, a separate prefix for each of the N generated passband periodic signals; and

combining, prior to transmission, each one of the separate prefixes with the corresponding one of the N generated passband periodic signals.

24. The method of claim 23, wherein the prefixes for each of the N passband periodic signals are generated in parallel.

25. The method of claim 23, wherein the step of combining each one of the separate prefixes with the corresponding one of the N generated passband periodic signals includes:

prepending the generated prefix to the corresponding one of the N generated passband periodic signals.

26. The method of claim 23, wherein generating a separate prefix for each of the N generated passband periodic signals includes, for each separate prefix:

generating a first cyclic prefix part; and

generating a second prefix part, the second prefix part being generated using a different generation technique than the first prefix part.

27. A periodic signal processing method, the method comprising:

generating a multi-part prefix from a first periodic signal, the step of generating a multi-part prefix from the first periodic signal including:

performing a cyclic extension operation on the first periodic signal to generate a cyclic prefix portion;

generating a continuity prefix portion; and

appending the cyclic prefix portion to the end of the continuity prefix portion.

28. The method of claim 27, wherein generating a continuity prefix portion includes:

processing the cyclic prefix portion to generate the continuity prefix portion from the cyclic prefix portion.

29. The method of claim 28, wherein generating a continuity prefix portion includes:

processing a preceding periodic signal to generate the continuity prefix portion from the preceding periodic signal.

30. The method of claim 27, wherein generating a continuity prefix portion includes:

processing the cyclic prefix portion and a preceding periodic signal to generate the continuity prefix portion from both the cyclic prefix portion and the preceding periodic signal.

31. The method of claim 30, wherein said processing of the cyclic prefix portion and a preceding periodic signal includes:

performing a cyclic extension operation on the cyclic prefix portion to generate a first cyclic extension;

performing another cyclic extension operation on the preceding periodic signal to generate a second cyclic extension, the first and second cyclic extensions corresponding to a signal time period which is the same for both the first and second cyclic extensions; and

combining the first and second cyclic extensions corresponding to said signal time period to generate said continuity prefix portion, the step of combining the first and second cyclic extensions including:

windowing the combined cyclic extensions using an attenuating window.

32. The method of claim 31, wherein each of said cyclic extension operations includes copying a portion of the signal upon which said cyclic extension operation is performed.

33. The method of claim 27, wherein the continuity prefix portion has a frequency which is different from the frequency of the first periodic signal but has a phase at the point where the cyclic prefix portion is appended to the continuity prefix portion that is the same as the phase of the cyclic prefix portion.

34. The method of claim 27, wherein the continuity prefix portion has a phase at the beginning of the continuity prefix portion that is the same as the phase of a preceding periodic signal.

35. The method of claim 27, wherein the first periodic signal is one of N period signals corresponding to N different tones of a multi-tone signal, where N is a positive integer greater than one, the method further comprising:

generating for each of the N periodic signals, other than the first periodic signal, a separate multi-part prefix from a corresponding one of the N periodic signals, thereby generating N-1 multi-part signal prefixes in addition to the multi-part prefix generated from the first periodic signal.

36. The method of claim 35, further comprising:

prepending each of the generated N-1 multi-part prefixes and the generated multi-part prefix generated from the first periodic signal to the corresponding ones of the N periodic signals from which the multi-part prefixes were generated.

37. The method of claim 36, further comprising the step of:

filtering each of the N periodic signals with prepended multi-part prefixes in parallel; and

transmitting the filtered N periodic signals with prepended multi-part prefixes into a communications channel.

38. The method of claim 37, wherein the step of transmitting the filtered N periodic signals with prepended multi-part prefixes includes broadcasting different ones of the N periodic signals using different antennas.

39. The method of claim 38, further comprising:

allowing the N broadcast periodic signals to combine in the communications channel to form an N tone OFDM signal.

40. A method of broadcasting signals representing tones of an N tone multi-tone signal, for a first period of time corresponding to multiple symbol transmission

periods and for a second period of time also corresponding to multiple symbol transmission periods, where N is a positive integer greater than one and the tones in the N tone multi-tone signal are fixed for the first and second periods of time but include different tones in each of the first and second periods of time, the method comprising:

broadcasting signals corresponding to different tones of the N tone multi-tone signal during the first period of time using a fixed first set of M different antennas where M is an integer and where $M \leq N$; and

broadcasting signals corresponding to different tones of the N tone multi-tone signal during the second period of time using a fixed second set of M different antennas, at least one antenna in the fixed second set of M different antennas being different from the antennas included in the fixed first set of M different antennas.

41. A method of sequentially transmitting symbols in a multi-tone signal communication system using N tones per symbol period, wherein the N tones remain the same for multiple symbol periods, the time period in which the N tones remain the same being a dwell, the method comprising:

for each symbol transmission period of the dwell:

transmitting N signals corresponding to each one of the N tones of the multi-tone signal, each one of the N signals being transmitted on a corresponding one of a first

plurality of antennas, the antenna being used to transmit signals corresponding to a particular tone during the dwell remaining the same throughout the dwell.

42. The method of claim 41, further comprising the step of:

for each symbol transmission period of a second dwell:

transmitting N signals corresponding to each one of the N tones of the multi-tone signal, each one of the N signals being transmitted on a corresponding one of a second plurality of antennas, the antenna being used to transmit signals corresponding to a particular tone during the second dwell remaining the same throughout the second dwell, the second plurality of antennas including at least one antenna which is different from the antennas included the first plurality of antennas.

43. The method of claim 41, further comprising:

for each of a plurality of symbol transmission periods in the dwell:

rotating the constellation of symbols from which consecutive symbols are transmitted using one of said N tones by a fixed amount; and

selecting a symbol to be transmitted from a constellation of symbols to be transmitted

using a signal corresponding to one of said N tones.

44. The method of claim 43, wherein the rotation of the constellation during each of the plurality of symbol transmission period has a cumulative rotational effect on the constellation from which symbols are selected causing the rotation of the symbols in one symbol transmission period to effect the constellation from which symbols are selected during the next symbol transmission period.

45. The method of claim 43, wherein the rotation of the constellation during each of the plurality of symbol transmission periods is by a fixed additive amount which does not effect the position of the symbols in the constellation from which the next symbol is selected.

46. The method of claim 43, wherein said fixed amount by which the constellation of symbols is rotated is a function of the tone frequency.

47. The method of claim 46, wherein said fixed amount by which the constellation of symbols is rotated is also a function of the duration of a multi-part prefix to be transmitted with the selected symbol.

48. A transmitter for broadcasting a signal corresponding a multi-tone signal, the transmitter comprising:

a plurality of first through Nth periodic signal generators for generating periodic passband signals representing symbols, where N is a positive integer greater than 1, each one of the N periodic signal generators generating a periodic signal having a frequency corresponding to a different one of N tones of said multi-tone signal; and

a plurality of M antennas, where $1<M\leq N$, each one of the M antennas being coupled to at least one of the first through Nth periodic signal generators, each periodic signal generator being coupled to a single one of said M antennas.

49. The transmitter of claim 48, wherein M=N, each one of said N periodic signal generators being coupled to a different one of said M antennas.

50. The transmitter of claim 49, wherein the plurality of first through Nth periodic signal generators are housed in a portable device and are powered by a battery.

51. A system for generating and transmitting signals corresponding to an N tone multi-tone signal, where N is a positive integer greater than 1, the system comprising:

N periodic signal generator circuits for generating periodic signals, each periodic signal corresponding to a different tone one of the N tones of the multi-tone signal; and

N prefix generator circuits for independently generating periodic signal prefixes, each one of the N

prefix generator circuits being coupled to a different corresponding one of the N periodic generator circuits.

52. The system of claim 51, further comprising:

N filters for independently filtering the N periodic signals including prefixes generated by the N prefix generator circuits, each one of the N filters being coupled to a different corresponding one of the N prefix generator circuits.

53. The system of claim 52, further comprising:

a plurality of M antennas, where M is an integer and where $1 < M \leq N$, each of the N filters being coupled to a single one of the M antennas and each one of the M antennas being coupled to at least one of the N filters.

54. The system of claim 53, wherein M = N.

55. The system of claim 54, wherein $M < N$, the system further comprising, at least one analog combing circuit for combining signals from a subset of said N filters into a signal filter and for coupling each filter in the subset of said N filters one of said M antennas.

56. The system of claim 51, wherein each prefix generator circuit includes:

means for generating a multi-part prefix including a first cyclic prefix portion and a second signal continuity portion.

57. The system of claim 51, wherein each of the N prefix generator circuits generates a separate prefix, each one of the N separate prefixes having the same duration.

58. The system of claim 57, wherein each of the N periodic signal generators includes:

square wave generating means, each one of said N periodic signals including a square wave having a frequency component corresponding to one of said N tones of the multi-tone signal.

59. The system of claim 57, wherein each of the N periodic signal generators includes:

sinusoidal generating means, each one of said N periodic signals including a sinusoidal signal having a frequency component corresponding to one of said N tones of the multi-tone signal.